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ABSTRACT

This paper offers a detailed discussion of materials developed for the Chicago Mastery Learning Reading with Learning Strategies (CMLR/LS) program, an upper elementary program in which appropriate learning strategy instructions are embedded within the text for each assigned task. Its purpose is to provide researchers and educators with a description of one way to apply learning strategies theory to practice. The paper first presents an overview of the materials and explains how they are related to the program of instruction in Chicago. It then describes research strands of the program that were concerned with learning strategies and tasks taxonomies, the typology of text structures, and the process of instruction, including thinking aloud and adjunct questions and sequencing. The paper next describes the field testing of CMLR/LS materials. The final section of the paper provides an extended example of how each of the research strands fit together in a listening comprehension unit. (FL)

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EMBEDDING STRUCTURAL INFORMATION AND STRATEGY INSTRUCTIONS WITHIN MASTERY LEARNING UNITS*

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EMBEDDING STRUCTURAL INFORMATION AND STRATEGY INSTRUCTIONS WITHIN MASTERY LEARNING UNITS

A learning strategy is any information-processing operation that facilitates knowledge acquisition, storage, or retrieval (O'Neil & Spielberger, 1979). This operation may be initiated spontaneously by the learner or by the teacher in a strategy instruction. Reviews of the learning strategies literature (e.g., Case, 1978; Jones, Monsaas, & Katims, 1979; Levin & Allen, 1976; Rohwer, 1971, 1973) indicate that a crucial difference between high and low achieving students is that high achieving students begin at about grade 6 to apply spontaneously a repertoire of learning strategies with increasing efficiency so that by grade 11 or 12, they are functioning at the level of college students. Apparently, low achieving students do not make this developmental shift in strategy use at any time, without intervention. At the same time, it is clear from laboratory research and, in a few instances of applied research, that low achieving students can be taught to use effective strategies which aid comprehension.

A similar phenomenon happens in the development of efficient reading strategies. Studies of good and poor readers and young and old readers (Jones, Amiran, Katims, & Monsaas, 1980) suggest that good readers and older readers are aware of and utilize the structure of the text or task even when no cues are given (e.g., Meyer, 1980), while poor readers and younger readers seem to be relatively unaware of the author's textual schema, important vs unimportant information, and the various parts of a text or story (e.g., Brown, Smiley, & Lawton, 1977; Stein, 1980).

Thus, two separate strands of literature indicate that a major difference between high and low achieving students lies in

their awareness of structural information in text passages and the information-processing operations necessary to use that information. One way to improve reading and learning would be to embed the structural information and learning strategies within the instructional materials used as worksheets; this was the method used in the upper levels (grades 5-8) of the Chicago Mastery Learning Reading Program (CMLR), currently being developed for citywide distribution in the Chicago Public Schools. To distinguish these materials from the lower levels in which structural information and strategy information is implicit, the upper level materials are designated as the Chicago Mastery Learning Reading materials with Learning Strategies (CMLR/LS). The review of this literature, description of materials and procedures, and data analyses for the research community have been given elsewhere (Jones, 1980; Jones, Amiran, Monsaas, & Katims, 1980).

The purpose of this paper is to describe the rationale and development of CMLR/LS materials for teachers and administrators who are interested in learning about them and possibly applying some of the ideas to locally-developed programs or to classroom practices. The first section will provide an overview of the materials and how they are related to the program of instruction in Chicago. The next sections will describe the learning strategies and tasks taxonomies, the typology of text structures, the use of self-addressed adjunct questions, and sequencing. The last section will provide an extended example of how each of the research strands above - learning strategies, structure of text, adjunct questions, and sequencing - fit together to apply to one unit.

CMLR/LS: Overview of the Materials

Each CMLR/LS unit is addressed to one or more of the 131 key

objectives for levels K-N (grades 5-8). These upper level objectives are divided into three strands: Comprehension, Study Skills, and Literature. The Comprehension and Literature objectives focus heavily on understanding narrative fiction (especially character traits, mood, and plot); differentiating facts from opinions and using factual information in specific tasks such as inferring from facts or supporting a principle or point of view and differentiating elements of poetry including symbols. The Study Skills objectives have quite different orientations. Some of them focus on developing effective learning/reading strategies. Others emphasize dictionary and library skills. And there are also a number of decoding and grammar objectives which deal with such problems as dividing syllables, forming plurals for irregular nouns, forming contractions, constructing new words given lists of prefixes, roots and suffixes, and so on.

The basic mastery learning model developed by Bloom (1973) and Block and Anderson (1975) is described by Adelman (1980) in the first paper of the IRA symposium on CMLR materials. However, we will review the key features briefly before describing the materials. In fact, this model can be summarized in four words: teach, test, reteach, and retest. Teach the students in terms of a specific objective. Test for mastery of that objective using a criterion-referenced test that is addressed only to that objective. Reteach those who failed to attain mastery using a different teaching strategy. Retest using a criterion-referenced test that is parallel in structure and in all other essential characteristics to the Formative Test. These practices or instructional procedures, plus the belief that all children can learn under appropriate

teaching/learning conditions such as those described above, constitute the essence of the mastery concept.

It is also important to point out, as well, that these procedures, by definition, organize instruction in terms of learning units consisting of an initial instruction, a Formative Test, an additional corrective activity, and a parallel criterion-referenced test.

Each CMLR/LS unit is organized as follows. First, there are Student Activities (SAs) which are addressed to one or more of the key objectives. These SAs constitute the initial instruction. Each SA consists of about 4-6 typewritten pages. Most SAs begin with the definition of a term. The term may be a concept such as character traits, a structure such as a sequential paragraph, or a skill such as summarizing. Below each concept is an example with an explanation. Frequently, the student is asked to paraphrase the definition of the term at this point. Then the student is asked to apply the concept, structure, or skill to new examples. In most instances, this application will be guided by strategy instructions or prompts (see below). This process is repeated for each new term. The last SA is usually a review of all major terms plus extra practice without any aids and strategy prompts.

The SAs represent what the field tests indicate is the minimum amount of instruction that is necessary to master the skill. There are, in addition, optional fun activities available in the Teachers Manual which the teachers are encouraged to use.

The activities and their rationale are described in another paper in this symposium given by Mann and Fridell (1980). The teachers are also encouraged to add extra examples, exercise problems, and supplementary materials including manipulatives if they wish or if they have students who are exceptionally far behind. But, it is important to emphasize that these and the optional activities in the manual are supplementary. Our field tests and summer school experiences using the materials suggest that most students who are on level or even a year behind ought to be able to master the objective using only the SAs.

After the students have worked through the SAs, they are ready for the Formative Test which parallels the CRT for each objective. Those who pass have three options. They may peer tutor. They may read silently. Or they may do the Enrichment Activity (EA) provided for each unit. The EAs, described elsewhere by Mann and Fridell (1980), are always addressed to the unit objective and typically take the student well beyond the level of the objective. Giving the students this choice is an important feature of the CMLR model. Passing the Formative Test and having these options becomes a source of status and motivation to pass the next Formative Test. Moreover, many teachers believe that allowing the mastery students to choose gives them a sense of internal control over their class time which is another source of motivation.

Those who do not attain mastery are required to do the Additional Activity (AA) that is provided in each unit. The AA

contains a review of all terms, a different teaching/learning strategy, and more practice. The strategies used in AAs are quite varied. If paraphrasing in words was emphasized in the SAs, visualizing may be utilized in the AAs. If structural information was provided in the SAs, the AAs may require the student to work it out for himself or herself (with many hints and prompts). Obversely, if the structures and rules had to be "discovered" or inferred in the SAs, they may be provided in the AAs. Sometimes AAs focus on the problem of careless response choices. Other AAs focus on the problem of carelessness during reading. Some AAs require the students to use their fingers to read graphic information; others require constructing models or creative writing. All of them require only a pencil and paper. And all of them are devised for minimal instruction.

This last point is important because the students who fail the Formative Test are not a homogeneous group of "failures." To the contrary, they may have failed for quite different reasons and may have different remedial needs. Some students fail to master the objective because they are slow and simply need more practice and feedback. Some students fail because they were inattentive or absent. Others may have been fully prepared but "blew the test" for idiosyncratic reasons such as illness or emotional upset. Another reason for failure is confusion. Typically, those who failed because they were slow or because they had idiosyncratic reasons can do the AAs with virtually no help from the teacher. Frequently, those who were inattentive or absent can also do the AAs by themselves or with some help

from peer tutors. This leaves the teacher free to focus all of the attention on the students who need help the most: the confused.

This fact is a most powerful and economical feature of the mastery learning concept. On the one hand, there is group instruction before the Formative Test; everyone in the class works through the same SAs, a real economy of the teacher's time which may also yield a far greater amount of instructional time than any model using grouping within a class. On the other hand, there is individualized, corrective instruction with a low teacher/student ratio as well as additional practice and feedback for those who need it. This "second chance" mechanism provides for a far greater pass rate than any model using norm-referenced tests or criterion-referenced tests without an additional instruction and second chance at taking the test. This mechanism prepares more students for the next objective and therefore allows a greater equality of educational opportunity than any model not providing a second chance.

It will also be recalled from the Adelman and Katims (1980) paper that the CMLR inservice and Teacher Manuals recommend that the initial instruction is group instruction given to all members of the class. This is because all of our data from field tests (Jones, Monsaas, & Katims, 1979; Katims, Smith, Steele, & Wick, 1978), large scale implementations (Jones & Katims, 1980; Katims, 1979), and baseline data from various schools consistently indicate that CMLR materials at all levels from kindergarten to eighth grade facilitate reading comprehension on norm-referenced

and criterion-referenced tests for students who are below level, on level, and above level. Typical gains range from 1¼-1½ years for use in the school year and from 3.5-4.6 months in 6-week summer school sessions. Why this is so is unclear, but it is because of this consistent pattern that we recommend group instruction.

To summarize, the mastery learning model requires an initial instruction addressed to specific objectives, a Formative Test to diagnose who is ready for mastery, and a corrective followed by a parallel criterion-referenced test. In this general model, the initial instruction may be individualized or group. In the CMLR model, the teachers are strongly discouraged from using more than two CMLR units at one time; instead they are encouraged to use only one CMLR unit for the entire class. A CMLR unit consists of 2-6 Student Activities addressed to one or more key objectives in the matrix of 273 key objectives defined by the Continuous Progress/Mastery Learning system of objectives and tests; an optional fun activity; a Formative Test that is parallel to a CRT; an Additional Activity, using a different teaching/learning strategy for those who did not attain mastery on the Formative Test; and an Enrichment Activity, also addressed to the unit objective, for those who did attain mastery. These materials have improved reading substantially in several field tests and large-scale implementations.

Learning Strategies and Tasks Taxonomies

Learning strategies include a wide range of memorizing and reading strategies which form a continuum, ranging from relatively

simple strategies to relatively complex. Since strategy use depends largely on the task at hand, the continuum of learning strategies is linked interactively with a continuum of task demands. The specific points on these two continua are given in table 1. Notice that although the strategies and tasks do form a continuum, there are only two basic categories of strategies: linking strategies and constructive strategies. Linking strategies refer to the range of information-processing operations which link or attach discrete bits of information to each other or to previously acquired information. Linking strategies include labeling; rehearsal - repeating two or more linked items; and list elaboration - either linking the items in interactive mental pictures so that the items to be remembered together are linked together in one image, or categorizing related items. Linking strategies may or may not involve comprehension of the information in a given list.

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Insert table 1 about here.

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Constructive strategies involve comprehending the meaning and context of complex lists and connected discourse. To construct something means to put together the parts of the thing to give it a structure or order as well as to interpret and explain. There are two types of constructive strategies: generative and reasoning. Generative strategies are strategies in which the learner generates meaning by translating the information into previously acquired information, separating

the message into component parts, or transforming the information into representations which either graph the information in some way as in a flow chart or outline, or which reduce the information by rules which categorize or "chunk" the information. Generative strategies include restatement--paraphrasing and/or visualizing; discourse elaboration--linking complex information in term-definition sets or name-fact sets by creating verbal stories or mental images which show the meaning of each part of the information and simultaneously link each part; analysis of complex prose into component parts in terms of its structure, theme, or levels of ideas; summarizing; reordering or rearrangement of the parts; and transformational representations.

Reasoning strategies involve either integrating complex information involving more than one pronoun, indefinite article, or elliptical reference; making inferences from information that is not explicit; or making comparisons to unspecified phenomena. Constructive inference, reconceptualization, metaphorical or analogical reasoning, and synthesis are examples of reasoning strategies (see Jones, Amiran, Katims, & Monsaas, 1980).

As illustrated in table 1, the learning strategies classification parallels a classification of tasks which begins with simple lists and connected discourse and progresses to complex lists, prose passages, and vocabulary tasks. The two classifications parallel each other in that each strategy is defined partly in terms of the demands of the task to which it is linked. Reordering, for example, is defined in terms of reordering

disorganized but categorizable or cross-classifiable items which appear in the CRTs for "Making Lists" and for outlining. Similarly, prose analysis is defined in terms of analyzing organized prose passages and would obviously be totally inappropriate for disorganized lists.

Two criteria were used to develop these two classifications. First, there was the question of complexity as a criterion of task difficulty. Disorganized, categorizable sentences are more difficult to learn and require a more complex learning strategy than categorized lists (e.g., Frase, 1969). Similarly, paraphrasing is most appropriate for sentences and vocabulary definitions that are given (as opposed to inferred), while summarizing is most appropriate for paragraphs and longer, more complex passages, though they may involve some paraphrasing as well. Second, following Amiran (1980), we reasoned that the degree of explicitness was a major criterion of task difficulty; passages containing many ellipses, metaphors, analogies, and symbols are more difficult to comprehend than passages in which all elements and relations are explicit. This is consistent with research on ellipses in texts (Whiting, 1980; Hillyard & Hidi, 1980).

Not surprisingly, the learning strategies and tasks classifications roughly parallel the Taxonomy of Educational Objectives developed by Bloom and his associates (1956). This taxonomy defines six categories of objectives or levels of learning: knowledge, translation, application, analysis, synthesis, and evaluation. The learning strategies/tasks classifications were developed independently of Bloom's taxonomy since Bloom does not

consider learning strategies or the definition of specific types of tasks. However, because Bloom's taxonomy and our taxonomies generally vary according to the level of task difficulty, the two sets of taxonomies should roughly parallel each other. The fact that the learning strategies/tasks taxonomies do in fact roughly parallel Bloom's taxonomy suggests that the learning strategies/tasks taxonomies define the parameters for strategies and tasks for the range of objectives covered in Bloom's taxonomy.

The major exception to the degree of fit between the two typologies is with regard to the last category. Bloom (1956) argues that a taxonomy ends when its elements begin to refer to another domain. Bloom's taxonomy ends with evaluation which refers to using internal and external criteria to make judgments about the value of a particular purpose, idea, story, etc. The learning strategies/tasks taxonomies end with constructive reasoning for texts which are poorly constructed and/or contain many inexplicit statements. To cope with such tasks, the reader must make judgments involving concepts and analogs from other domains to apply to the task at hand. Thus, while the learning strategies/tasks taxonomies end by referring to other domains, the reference is quite different from Bloom's taxonomy.

Another difference between the two sets of taxonomies is that while Bloom's taxonomy was intended to be comprehensive, the learning strategies/tasks taxonomies are not. To the contrary, there are mnemonics such as the one-bun technique for learning lists in serial order and the method of loci for

memorizing the main points in a speech or passage. These were not included because there are few school tasks which require these strategies. At the same time, the taxonomies described above are meant to be definitive in that they clearly define the parameters or boundaries of the range of strategy operations that are used for most school tasks. That is, while the strategies and tasks in table 1 are not comprehensive, they should serve as guidelines to delineate the critical points on each continuum so that new strategy-task sets could be added at any time using the criteria outlined above: the degree of complexity and the degree of explicitness.

Two categories of learning/reading strategies were differentiated: linking strategies which relate items to each other or to previously acquired information, and constructive strategies which require the reader to construct meaning from the information that is given. Constructive strategies may be generative in that the reader translates and processes only the information that is given, or they may involve extending the information that is given substantially by reasoning: making complex inferences, reconceptualizing, synthesizing, and analogical reasoning. Each of these strategies is appropriate for a range of specific school tasks. The strategies and the tasks form two interacting continua.

The Structure-of-Texts Variables

In our original proposal, structure of text was not discussed as an important variable that should be considered

systematically. However, it was evident from our first field-test experiences that something more than learning strategy instructions was needed. It simply was not possible to instruct low achieving students to "paraphrase," or "summarize," or "find the main idea" without defining each of these strategies in very concrete terms and providing some type of instruction which would help them learn how to apply each strategy.

To solve this problem, three procedures were developed. First, we reasoned that we should define each strategy in language that the students could understand. This was not a simple task given the diversity and vagueness of existing definitions. Moreover, we soon realized why existing definitions were so vague: it is not possible to define them explicitly without reference to specific text structures. Clearly, one summarizes a sequential passage describing the stages of development from infancy to old age differently from a compare-and-contrast paragraph or a story. Thus, the second procedure was to provide the students with definitions and, wherever possible, diagrams of text structures, using this term very broadly to mean the structure of any discourse to be comprehended - including analogies, tables, diagrams, and test structures (e.g., the structure of a multiple-choice test vs a completion test). Where possible, we tried to develop specific rules for specific text structures. The unit on Summarizing, for example, referred to a formula for each type of text. Not surprisingly, the existence of formulae and rules lead to yet another problem: getting the student to understand the concepts,

formulae, and rules and to apply them correctly to specific examples. Thus, the third procedure we developed was the provision of thinking-aloud models and self-addressed adjunct questions which directed the student to think the thoughts that were needed to understand the definitions and apply them.

The first procedure, defining each strategy, though difficult to do in concrete terms, is self-evident and will not be discussed further to explain what was done. Defining text structures is not at all self-explanatory and will be discussed in this section. The thinking aloud models and adjunct questions will be described in the next parts of this section.

To determine the text structures of prose passages, we analyzed the structures of samples of passages from two norm-referenced reading achievement tests, the Iowa Test of Basic Skills and the Stanford Diagnostic Skills; from all of the criterion-referenced tests (CRTs) for grades 5-8; from samples of science and social studies texts; and from the professional literature on text structures, especially the research of Meyer (e.g., Meyer, Brandt, & Bluth, 1978), Stein (e.g., Stein 1980), Mason (e.g., Mason & Kendall, 1978), and Anderson (e.g., Anderson, 1979; Armbruster & Anderson, 1980). It is important to note at this point that the prose passages in CMLR materials are mostly single paragraphs or short passages of 4-8 paragraphs, though occasionally, there are passages which are 1-2 pages (single-spaced). Structure refers to the arrange-

ment of specifiable component parts; i.e., parts which can be defined and consistently located according to specifiable criteria.

From our analysis of sample texts and the professional literature emerged three basic types of passage: subordinate, coordinate, and sequential. Subordinate prose consists essentially of one main idea plus related details. This main idea/details structure may take various forms: a single proposition plus supporting facts, elements, reasons, etc.; a single topic or name (e.g., the name of a country) plus a description of its attributes; a single vocabulary term plus the attributes contained in its definition; and so on. But perhaps the most common variation of the main idea/detail passage in school texts unfortunately is an extremely poorly constructed paragraph consisting of a subject plus a hodge-podge of facts, attributes, unnecessary and distracting rhetorical questions, and frequently irrelevant trivia intended to "motivate" the reader. It is also important to mention at the outset that main ideas may be stated or implied. Coordinate passages consist of elements which may be related to two or more main ideas or focal points. Examples here are compare-and-contrast passages and passages which describe problems-and-solutions, conflict-and-resolution, experimental cause-and-effect, or goal-and-outcome. Sequential passages are step-by-step descriptions of some processes such as how to make glass, or they may describe a series of events without attempting to assess cause-and-effect relations explicitly.

Examples would be the description of a battle or the sequence of events in a story. It is necessary to state here that while each of these passage structures could be found in a single paragraph or an entire passage, a common pattern was to find a structure in two or more related paragraphs within a longer passage. A typical example would be the definition of a problem in one paragraph and various solutions offered in succeeding paragraphs.

The examples of each type of passage are summarized and illustrated in figure 1. Note that the basic structure will vary according to whether the topic sentence is in the beginning, middle, or end of the paragraph. In addition, the subordinate, coordinate, and sequential structures are basic, underlying text structures while the others are manifest text structures: name-attribute, compare-and-contrast, cause-and-effect, sequence of events, and so on. The manifest structures given in figure 1 are not meant to be comprehensive. While we think that those listed are the most commonly used in elementary reading texts, it is entirely possible that an analysis of different subject areas and levels (e.g., a college physics text or a job training manual) may reveal new manifest structures other than those shown in figure 1 or indeed other sets of latent and manifest structures which are entirely different from those in figure 1.

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Insert figure 1 about here.

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How does the structure-of-text typology relate to the CMLR/LS materials? As indicated above, CMLR/LS materials are keyed into the matrix of key objectives and CRTs for reading levels K-N (grades 5-8) and we were committed to providing instructional materials which addressed those objectives. Nevertheless, we were also committed to exposing the students to as broad a range of text structures as we could. Therefore, we provided text structures for types of texts given in the CRTs in the units addressed to those CRTs and filled in the rest in the study skills units on summarizing, outlining, and other skills. Thus, over the four years (grades 5-8), the Chicago student is exposed to all of the text structures given in figure 1 except the argumentative which is too complex for elementary school levels.

A typical "exposure" consists of the following steps and procedures:

(1) Using printed workbooks, the student is given a definition of a text in language that is easily understood (e.g., an opinion paragraph).

(2) The student may be asked to paraphrase the definition in writing at this point or later.

(3) Then there is an overview of the text structure in prose form and in some type of line drawing or diagram.

(4) By written explanations the students are shown how to fill in each component part of the diagram with the appropriate type of information (e.g., "The opinion statement goes in

the section marked OPINION," "The reasons supporting the opinion go in the section marked SUPPORTING STATEMENTS," and so on.

(5) There is guided practice using strategy instructions in differentiating the appropriate type of information for each section. Thus, for the opinion paragraph, the student must differentiate (a) a fact from an opinion and (b) supporting information and reasons from non-supporting information and reasons.

(6) There is guided practice in putting it all together to answer questions of the type and form that will be on the test.

(7) There is a corrective activity using a different strategy for those who did not attain mastery on the Formative Test. The corrective always contains a review and additional practice as well as a different teaching strategy, it will be recalled. In the unit on identifying opinions, the students were asked to identify the line in the paragraph that contained the answer to a given question. This was done on the assumption that if a student failed the Formative Test, the failure may have been the result of careless scanning. The corrective also required the students to construct an opinion paragraph of their own.

It is important to realize that throughout the unit the teacher is provided with extensive answer keys and encouraged in every way to use them to explain why each answer is correct. The teacher is also encouraged to take the time to explain why

incorrect answers are incorrect and to ask the students to write in the correct answers on their papers.

Thus far, all of the descriptions above have focused exclusively on text structures for prose. The CMLR/LS materials provide structural information for other types of discourse as well; e.g., discourse in tables, maps, graphs, analogies, vocabulary terms and definitions, and so on. In the unit on diagrams, for example, it is explained to the student that answering diagram questions is essentially a matter of matching the key word in the stem to its counterpart on the diagram and that the matching procedure can be used effectively even when the student has difficulty in decoding complex and unfamiliar terms in the diagram and questions. Similarly, in a unit on analogies the student is given a complete definition of the structure of an analogy and the nine steps one must take in order to solve one.

CMLR/LS materials also provide information about different test structures, especially the structure of a multiple-choice test. There are several student activities devoted exclusively to explaining about how the response choices are constructed to include distractors which are "runner-ups" for the best answer, how students are often fooled by words which are natural language associates of a word in the stem, how easy it is to select a detail when the question calls for a main idea, how some questions require integrating information from two or more sentences, and so on. Various test-taking strategies were developed to address these problems. Especially important

is the process of systematically reading and testing out each response choice before selecting an answer. (For a more complete description of this typology see Jones, Amiran, Katims, Monsaas, 1980.)

Text Structure Manipulatives. Feiock (1980) has developed a most interesting, simple procedure for displaying the component parts of a word, prose passage, or test structure: she writes each word on a moveable object such as a tongue depressor so that the teacher can instruct the students to construct specific structures to match those given in the CMLR/LS materials or other materials which she uses.

To illustrate: in the unit on main idea and details, three paragraph structures are defined and diagrammed in terms of the location of the topic sentence. Type I paragraphs have the topic sentence in the beginning; Type II, in the middle; and Type III, in the end. Feiock selected one of the paragraphs from this unit, wrote each sentence on a strip of paper from a manila folder, and put them into an envelope. When she uses this manipulative, each student receives such an envelope. In the first part of her demonstration, she draws the Type I, Type II, and Type III diagrams on the chalkboard. In the second part, she asks the students to arrange their sentences to correspond to each diagram on signal. Corrections are made by rearranging the strips. Using similar procedures, she can instruct students to construct various word structures, sentence structures, outline structures, and paragraph structures as well as specific cause-and-effect relationships, categories,

and the like. Thus, she has created an inexpensive, simple, and highly effective product which allows students to manipulate complex and abstract text structures. Unfortunately, there are no data on the effects of using this type of manipulative with CMLR/LS or other materials but it seems highly likely that these procedures would greatly facilitate comprehension, especially for low achieving students.

Level effects. Brown, Smiley and Lawton (1977) and Anderson (1979) have shown that students instructed to pay special attention to the main idea of a paragraph often do not recall many of the details, and vice versa. Similarly, Meyer (1977) and Kintsch (1974) differentiate between levels of text in complex passages. High levels of text, usually given in the beginning of an article or paper, contain the purpose, theme or thesis statement, and an outline of the organization of the paper. High levels are contrasted with low levels or details. These researchers have found repeatedly (1) that students who focus on high levels of information recall the high levels better in a free recall situation and are vastly superior in tests involving integration of information and inference, compared to students who read for detail; and (2) that different manifest structures seem to be recalled differently by most students (e.g., name-attribute passages are not recalled nearly as well as more tightly organized passages such as problem-and-solution).

Since elementary students almost always have access to the text to be comprehended, the reader may wonder why level effects

on recall tests are relevant to the development of instructional materials in reading. The answer is a speculation: it is assumed (1) that some students do not read a text more than once even though it is available and therefore depend on recall, and (2) that comprehension would be facilitated by explaining to the students that there are different levels of information which should be processed differently. More specifically, the students are instructed to preview a text to examine any subheadings which would reveal high level ideas and passage organization and to pay special (greater) attention to main ideas and organizational statements during reading. These instructions presumably increase comprehension and recall of high level information. There are also instructions to locate the paragraph which contains the answer to a given question and reread it or scan it until the relevant information is found.

Text Structures and Functions. Text structures and levels will vary in their frequency and content according to the function of the passage in which they are contained. Texts that students are exposed to generally have one of three major functions: narrative, expository, or persuasive (Jones, Amiran, Katims, & Monsaas, 1980). The major function of a narrative text is to relate a story - either fictional or real. This category (narratives) would include any type of fiction as well as documentary stories. Expository texts communicate knowledge about a topic. These texts may be found in textbooks of all kinds (history, science, sociology, job training manuals, etc.);

any article in a magazine, newspaper, or journal devoted to describing and discussing research or to documenting specific events; and portions of narratives devoted to communicating knowledge about a topic. Persuasive texts seek to influence the reader to adopt a particular point of view, attitude, belief, or line of action; they therefore seek to change a person's values or philosophy in some way. Persuasive texts may be found in political, social, and religious manifestos; personal letters and other documents containing opinions, statements of value, etc.; and any type of advertisement or propaganda.

These categories are not meant to be defined rigidly. They are only guidelines which may serve the purpose of clarifying an inconsistency between the meaning of these words used by different people. Teachers of English and some researchers use these words to refer to functions. Other researchers refer to them as types of texts as if they were types of text structures. This is rather like "mixing apples and oranges," so to speak. While narratives, expository, and persuasive texts are clearly types of text, it is also evident that they may include various types of subordinate, coordinate, and sequential text structures. Consequently, it would seem that text function and text structures are distinct but cross-classifiable variables. Their relationship can be seen in table 2.

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Insert table 2 about here.

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Two features of table 2 are important. First, note how many different manifest structures may be found in each type of text. Second, it is interesting to see how many different types of manifest structures may be found in expository texts. This could be one reason why they are difficult to comprehend for low achieving students. It is hoped that conceptualizing texts in terms of structures and functions which may be cross-classified will resolve some of the disparities in the literature.

In summary, early field experiences indicated that it was necessary to provide the students with structural information about passages, graphically displayed information, words, and tests. An analysis of student materials and the professional literature indicated that there were three basic types of passage structures--subordinate, coordinate, and sequential--which underlie various manifest structures. Manifest subordinate structures contain one main idea/detail set: one topic or name plus attributes of the topic or name; a statement of one idea, proposition, or theme plus supporting details (facts, quotes, examples, reasons, etc.); a vocabulary term with a listing of the elements in its definition; and finally, a loosely-constructed idea or topic plus a hodge-podge of one or two essential facts, reasons, or attributes mixed in with unnecessary rhetorical questions and irrelevant trivial commentary. Manifest coordinate structures have two main idea plus details sets: cause-and-effect, problem-and-solution, conflict-and-resolution, compare-and-contrast. Manifest

sequential structures consist largely of describing or analyzing a series of steps or a series of events.

For each manifest structure, the students are given a verbal description of the structure and level effects as well as a diagram. In addition, they are given practice in identifying the component parts separately with strategy instructions and hints. Then, they have an opportunity to apply all the component parts together without strategy prompts and hints. It was suggested that the use of structural manipulatives would facilitate comprehension for low achievers. Finally, it was argued that manifest structures should not be confused with text functions such as narrative, expository, and persuasive.

The Process of Instruction

Thinking Aloud Models and Adjunct Questions. It is evident from the descriptions above that the learning strategy definitions and the text structure models varied from very simple and concrete to very complex and abstract. This fact raised a number of questions. How were we going to explain the abstract and complex concepts to students who had problems in comprehending abstract and difficult concepts? Even if we managed to work out definitions which were clear and easy to understand, how could we make sure that each child really understood how they were applied to specific examples? How could we provide instruction in basic concepts that would not vary greatly as a result of teacher differences, i.e., differences in definition, amount of explanation, and so on.

One solution to these problems was to provide examples of each concept with explanations which were thinking aloud models in that they showed the thought processes underlying the application of the concept to the examples. This procedure is illustrated in the unit on main idea and details. After explaining what a sequential paragraph is, there is an example of one. Just below the example, there is a statement which explains why the example is a sequential paragraph and identifies the words which serve as cues. These explanations are fairly short, typically 3-7 lines, and provide all students with a model of what the student should be thinking in order to apply the concept.

The research literature on adjunct questions provided another solution. While the data regarding factual and application questions is inconsistent (Andre, 1979), studies of self-addressed adjunct questions directing students to focus on finding the main idea in each paragraph (Andre & Anderson, 1979; Weiner, 1978) suggest that such questions are effective. We applied this line of research to use adjunct questions to guide the students to use the same thought processes as those given in the thinking aloud model. Returning to the example above, the students are presented with a sequential paragraph. Just below the paragraph there are "think" statements and "ask yourself" questions which guide the student to notice the cue words and content of the sentences and relate these facts to the definition of a sequential paragraph. In effect, the adjunct questions function as prompts to use structural

information and strategy instructions.

Following procedures developed by Jones and Hall (1980), we defined four levels of prompts: (1) step-by-step prompts which guide the students through each stage of thinking; (2) content-specific prompts which provide 1-2 hints with regard to answering a particular exercise practice item; (3) generalized prompts which instruct the student (in the exercise instructions) in very general terms to use the strategy and structural information; and (4) no stragegy prompt. Each unit begins with a level 1 or 2 prompt and ends with a level 4 prompt. Thus, as the unit progresses, the prompts are gradually withdrawn. If the unit is simple and straightforward such as the unit on similies which contains only one concept, the withdrawal process occurs only once. If, on the other hand, the unit is complex such as the unit on summarizing, each Student Activity may begin with a level 1 or 2 prompt because each activity within the unit (except the last) begins with a new concept or type of paragraph. Monsaas' (1980) paper provides a review of the literature on adjunct questions and extended illustrations of their use in CMLR materials.

Sequencing. Another solution to the problem of communicating complex structural information and strategy instructions to the student was to break down each concept and strategy into component parts and provide them to the student in small chunks which are sequenced to proceed from simple to complex. There are two ways to do this. If the component parts can be easily ranked from simple to complex such that each part can be

presented by itself as a necessary condition to understanding the next part, a linear sequencing model is appropriate. This model has already been illustrated above in the example of the opinion paragraph. The student first learns what is an opinion and how to differentiate it from a fact. Then the learner is presented with an overview of the component parts of an opinion paragraph, followed by practice in identifying and processing each component sequentially, beginning with the simplest part and ending with the most difficult and complex part. Finally, there is practice in locating and comprehending all of the parts when they are presented together as one whole.

The tandem sequencing model provides an alternative approach for complex structures which are difficult to sequence in a linear model because each part has a special vocabulary or complex criteria which must be taught simultaneously in order to recognize or locate it. Tandem sequencing is also useful when each part can be defined only in relation to several other parts. In this model the author of the unit presents a concept with two contrasting, complex examples which contain each part of the concept. Then the author identifies or reviews each of the parts using the content of the first example in a single statement or paragraph that is essentially an overview. Next, the author focuses in depth on component 1 as it applies to example 1. Following this, the author asks the student to show how component 1 applies to example 2. These last two steps are repeated until both the author and the student have worked through each part of both examples.

This process can be seen in the unit on techniques of characterization: dialogue, a description of a character's action, and a direct statement from the author telling the student what the character thinks and does. The unit begins with a definition of the three techniques with brief examples. This is followed immediately by two "stories." The first is about a pretty girl called Alice May who is described as resting serenely on some leaves under a tree on a beautiful day (the direct statement). She raises herself up lazily and talks about what a beautiful day it is (the dialogue). Then she makes a soft pillow for herself to rest on and watches the clouds (the action). The second is about a slimy monster called Org, the Ugly. Org is described as a repulsive, hairy creature, who shouts at the sky and angrily hurls a tree down the side of the mountain (the direct description, the dialogue, and the action, respectively).

After the two stories, the author of the unit presents the first few statements from story 1 again to show the student why it is an example of a direct statement. Next, the author directs the student to select the statements which represent the direct statement in the Org story. Then there is an immediate feedback and correction procedure given by the author. The reason for this is simple: the student must understand how this technique works in order to clearly differentiate it from the others. These procedures are repeated until the author and the student have worked through all three techniques in both examples.

Sequencing the skills within a unit is not the only dimension that is sequenced within CMLR/LS units. The length of the passage, the number of response choices, and content are also sequenced. In the beginning of a unit, the length of the passage is very short and the number of alternative response choices is frequently limited to two, and often there are hints as to which one is correct. This feature builds-in success and allows the student to focus on understanding the skill being taught and its application to new examples. Once the concept underlying the skill is understood and mastered, then the student can begin to apply the skill/concept to increasingly complex and lengthy examples. The unit on main idea and details, for instance, begins with simple category lists intended to show the student (later) that main idea and details in a paragraph are closely equivalent to a category label or topic and its examples. The next section uses paragraphs that have only 3-4 sentences which, when diagrammed, are the same structure as the category label plus 3-4 examples. Response choices to the exercise problems in these two sections are devised to be extremely easy so that the student is certain to get the right answer and therefore presumably focus on the structure of the category lists and paragraphs rather than their content. As the unit progresses, the passages become increasingly longer while the content moves from simple/familiar/concrete to become more complex/unfamiliar/abstract (see Stoll, 1980 for sequencing model).

To summarize, every effort in the process of instruction is devoted to two goals: (1) building in guided success in the beginning phase of instruction and (2) training the student to become increasingly adept at transfer with the supports involved in the guided success phase. Success is built in the beginning (1) by providing thinking aloud models and step-by-step strategy/thinking instructions for the student to replicate the steps in the thinking aloud models and (2) by controlling the structure of the items to which the steps are applied. In the beginning, the examples used by the author and in the exercise problems completed by the student are short, simple, concrete, and familiar with limited and/or easy response choices. Transfer capability is encouraged by withdrawing the strategy instructions and prompts, and by gradually increasing the length, complexity, abstractness, and unfamiliarity of the exercise items.

Developing and Field Testing the Materials

Developing a unit is a complex group procedure that takes from 2-3 weeks for easy units or 2-3 months for difficult ones which require developing definitions, rules, and formulae from scratch. The steps in developing and testing a unit are given below.

Task Analysis. Each writer begins with a task analysis of the CRT to which the unit is addressed. The writer then checks with the coordinator to determine if the CRT adequately addresses the objective that is given for that CRT in the Curriculum Guide

in Reading for the Elementary School (1974). If not, other tasks are added. The tasks are then ranked in order from simple to complex. The writer uses this to outline the sections in the unit.

Unit Development. Usually each task is dealt with in a separate section. The writer then develops a definition of the skill, concept, structure, etc.; appropriate examples to illustrate the defined term; exercise problems which become increasingly complex; and strategy prompts to use the skill, concept, or structure. These are checked by the coordinator for consistency of definitions, sequencing, content, interest, clarity of instructions, and format.

The Review Process. Once a unit is typed, it must be read by at least two readers. For any problem other than a typographical error, the reader lists or marks in some way each problem to be discussed by the writer and the reader who is always another writer. For each problem, the reader asks the writer to explain why something was done and what effect was intended. The reader then explains why the given segment of writing fails to yield the intended effect. Then the two discuss alternative ways to attain the desired goal. If they cannot reach a solution or if the writer rejects the reader's analysis of the problem, the writer calls for another opinion by another reader or the coordinator and the analytical/problem-solving process is repeated until a solution is found which is agreeable to everyone concerned. If no agreement can be reached by group consensus the writer is left to make his or her own

decision with the condition that the decision may be revised after field-testing should the field test indicate that the segment contains a problem.

The Field-Test Process. Typically, each unit is field tested by from 2-6 teachers. Each day that the unit is used by a teacher, that teacher is visited and/or observed by a writer or the coordinator. After the lesson, the observer asks the teacher to discuss any problems of format, clarity of instructions, content, or sequencing. Each comment is carefully noted by the observer, as are any problems observed in the classroom. These notations are filed with the unit for revisions.

The Revision Process. The revision process begins with an analysis of errors on the Formative Test and the CRT. If there is no error pattern but there is a high rate of failures on the Formative Test, the teachers are visited to ask if the test seemed too difficult or if the problem was in the materials. The error analysis and a summary of the teachers' comments are presented to the group including the coordinator. The group then decides whether to revise the test, the materials, or both. If the error analysis reveals a disproportionate number of errors on a given item, that item is analyzed for the source of difficulty and then revised. Substantial revisions are usually field tested.

It is clear from the description of this process of developing a unit, reviewing and revising it, field testing and revising it again, that the process is time-consuming, but it

is worth the cost because these procedures are another means of insuring student success. That is, almost all of the units which are finally printed are almost by definition "successful units" in that there is field-test data showing a high rate of mastery. These time-consuming developmental procedures have teacher benefits as well. Because there is such a heavy input in each unit from our field-test teachers who vary greatly in their personalities, teaching styles, and interests, there is much anecdotal evidence that other teachers generally like the materials.

Listening Comprehension: An Extended Example

The unit described here, entitled Listening Comprehension, was addressed to an objective involving listening, but it will become clear that the contents apply to both listening and reading comprehension. The unit is a level K unit (grade 5). The test requires the students to listen to a story, about one page in length (typewritten and single spaced), describe three events in writing, and then make illustrations which reflect the meaning of the events. Clearly, this test format ignores many critical aspects of comprehending narratives such as identifying the basic structure of the story and selecting key elements, but the test was a given and could not be changed. What could be done, however, was to orient the unit toward these unstated objectives (identifying the basic structure and key elements) as well as the stated objective of perceiving distinct events.

In one respect this unit is a very poor example to use as a representative sample of CMLR/LS materials; it is literally the only unit in all the CMLR/LS materials in which the unit objective markedly differs or extends the stated objective. It was selected in spite of this because up to now, this paper has dealt almost exclusively with the structural variables of expository and persuasive passages and discourse given in graphic form. The Chicago objectives are heavily concerned with comprehension of narrative passages and there are many units addressed to these objectives: inferences about mood, motivation, and character traits; compare-and-contrast analysis of character traits; as well as identification of setting, plot, and style. The listening comprehension unit is typical of units in this strand of objectives.

The unit consists of four Student Activities (SAs), a Formative Test (FT), an Additional Activity (AA), and an Enrichment Activity (EA).

Background readings for this unit consisted largely of papers by Stein, Nezworski, and Trabasso. Especially important are (1) their definition of story structure in terms of the characters' motivation and goals; and (2) their categories of structural information: the setting, the initiating event toward attaining the goal, the characters' internal responses to the initiating event, the overt attempt to attain the goal, the consequences of attaining or failing to attain the goal, and the characters' reactions to the consequences (Nezworski, Stein, & Trabasso, 1979; Stein, 1978).

SA #1: Parts of a Story. The first section defines a story as having a beginning which states a goal, a middle which deals with trying to reach the goal, and an end which states the success or failure of reaching the goal. This definition is given after an example with a thinking aloud explanation of the example. Each component is elaborated in subsequent sections. The beginning defines the setting, the main character who has the goal, and the goal itself. The middle section defines trying to reach the goal in terms of specific efforts to reach the goal, and the results of each effort. The end consists of the final consequences or result plus the main character's reaction to the final result.

Each section contains the elaborated definition and an application of it to a short passage presented earlier. The last section is a review in which the student is asked to paraphrase each of the elaborated definitions and a final practice in which the student must apply each part of the elaborated definitions to three new stories in a structured format provided by the author. This format is given in figure 2. The format is in itself a graphic representation of the story because it shows the three sections and each component part. The presentation of the labels and definitions of each part provide step-by-step prompts which guide the student in conceptualizing the story and in taking notes to represent its structure.

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Insert figure 2 about here.

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SA #2: Listening to Stories. In the previous activity, all of the stories were available to the student in writing. It was assumed that learning about the structural information and note taking strategy was a sufficient memory load which would be inhibited greatly by having to recall the contents of the story. It is also important to note that the SA #1 stories contained all of the information needed to define the structure. SA #2 is devoted to two problems: inferring parts of this story and using the prescribed note taking procedures for stories that are read. Typically, the problem of inferring each part would be dealt with in a series of sections. However, this unit is the last in the comprehension strand for level K and since inferences of the setting, etc., are worked through in an earlier unit on The 5 W's (who, when, where, what, and why) and in other units, it was reasoned that further practice was unnecessary. Therefore, inference is only defined and illustrated briefly as a prompt to remind the students that they need to use these skills.

The remainder of SA #2 centers around taking notes on stories read by the teacher. Altogether there are six stories. Each story has a corresponding note taking box or chart. The first chart contains a level 1 prompt in that it repeats completely all of the structural information given in SA #1 and in addition has the notes partially filled in. The second chart has only the labels and two notes filled in (a level 2 prompt). The remainder of the charts have only the labels (still a level 2 prompt).

SA #3: Longer Stories. In SAs #1 and #2, the stories are relatively short, from 6-24 lines, with all but the last being 6-17 lines. In SA #3, all of the stories are longer, and the structural prompts are removed. Each story is accompanied by a chart but it is no longer divided into three sections with labels for beginning, middle, and end, and the labels for the component parts of each section are deleted. The only label in these boxes is "Event Notes" with unnumbered lines evenly spaced in the box.

The purpose of this activity is threefold: (1) to work toward transfer without prompts, (2) to provide an abbreviated note taking procedure to use while listening, in place of writing out complete sentences, and (3) to direct the students to use the note fragments as the basis for writing sentence summaries (written after listening) because the test format requires sentence summaries. The first sections provide an example showing how to write abbreviated notes with the letter N to stand for "Narrator," and sentence fragments instead of complete sentences. In the exercise below this example, the students are asked to use the sentence fragments in their notes to make complete "Summary Sentences." The remainder of this SA consists of taking abbreviated notes from longer stories of 17 lines or more, and writing summary sentences on a separate sheet of paper.

SA #4: Taking Notes on Student-Generated Stories. This is the Ungraded Optional Activity. The students are asked to find a picture or series of pictures from a magazine or newspaper and develop a story that incorporates the picture(s). Each student tells his or her story to the class while the remainder of the

class takes notes and writes summary sentences.

FT. This consists of a 32-line story read by the teacher (twice). The students are asked to take notes on a separate sheet of paper, write summaries of three different events in the story, and draw pictures which represent the three events. In order to be counted as correct, the event summary has to be accurate and in the correct order. This is made clear in the instructions. Since understanding a story in terms of attempts to attain a goal by the main character is not an official, stated objective, the unit objectives were not tested; i.e., the unit FT must be an equivalent of the CRT for each objective.

AA: Events and Summary Review. This activity, required for those who failed the FT, begins by reviewing the definition of an event. After this, the students are instructed to read a short story. Below the story are scrambled notes. The students are asked to write out the notes in the correct order. Thus, a reordering strategy is used to emphasize the need for a correct sequence of events in order to make sense. In the next activity, a new story is presented in groups of sentences which describe a series of events. That is, each group of sentences describes one event. The groups are presented sequentially, one below the other, using only 2/3 of the page and thereby forming a column. The remainder of the page contains sets of lines for the students to use to take notes. This column is labeled "Event Notes" and each group of lines is labeled "Event 1," "Event 2," and so on. The final section involves taking event notes as the teacher reads a story, and writing summary sentences after reading.

EA: Writing a Story. In this activity, the students must write a story from a chart like the one used in SA #1, which defines each of the parts of a story. This activity, it will be recalled, is only for those who attained mastery on the FT. The activity utilizes all of the skills and concepts taught throughout the unit and uses a very high level processing strategy: creative application.

Summary and Conclusions

This paper was not intended to be a review of the literature. Rather its aim was to provide researchers and teachers with a presentation of one way to apply learning strategies theory to practice: namely, the development of the CMLR/LS materials. Thus, instead of the traditional format of working through a statement of a theoretical problem, the hypothesis, design, procedures, results, and discussion, the format here has been more chronological to emphasize the complex interaction between review-of-the-literature research, development of materials, and field testing.

CMLR/LS started with (1) the definition of a learning strategy as an operation performed by the student which influences the acquisition of knowledge (including knowledge of learning strategies and skills), storage, retrieval, and transfer; (2) the assumption that different strategies are appropriate for different tasks; and (3) the assumption that embedding appropriate strategy instructions within the text for each task facilitates comprehension and skill acquisition.

The first field tests revealed that the students could not be directed to visualize, paraphrase, summarize, etc., without providing instructions regarding how to do these things. Since the application of each strategy depends on the structure of the text and test, it was necessary to provide the students with definitions of specific structures, the appropriate cues wherever possible, and, where necessary, rules and formulae showing the student how to apply the strategy or skill to the given structure. It was also necessary to develop some vehicles to communicate all of this information and to help the student during the application process.

As a means of solving these problems, structure of text and adjunct questions were defined as key variables which had to be researched and considered systematically in every unit. Subsequent field research indicated that embedding structural information and prompts to use it via self-addressed adjunct questions was both practical and effective. Text and test structures were derived by analyzing sample texts, tests, and the structure-of-text literature. These analyses formed the basis of the structure-of-text typology. Thus, a problem in the field lead to a review of the literature and analysis of certain raw materials which were then used as the basis for a theoretical framework which generated new original applications and further research. This combination of top-down and bottom-up research procedures was highly productive.

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TABLE 1

STRATEGIES AND TASKS

TYPE OF STRATEGY	STRATEGY OPERATIONS AND COGNITIVE PROCESSES	TASK LABEL	TASK ATTRIBUTES
LINKING STRATEGIES	Strategies that link items or lists to each other or to stored information	Simple Lists	Items in a series, pairs, or array
labeling/naming	The act of saying to oneself the name of each thing to be learned; links each item to previously stored verbal code (Rehearsal also links items in a series to each other by frequency of associations.)		Items may be meaningful or meaningless, individual or paired, organized or scrambled, pictures, words, objects
list elaboration	The process of linking items in interactive images		Items typically unrelated though may be related
visual verbal	Process of linking related items by clustering within categories or by sentence elaboration		Items may be conceptually related or cross-classified; scrambled or unscrambled
CONSTRUCTIVE STRATEGIES	Strategies that construct overall meaning by generative processes or reasoning	Discourse and Complex Lists	Sentences, definitions, passages
			Disorganized and/or multi-level lists, extremely long lists
Generative Activities	Use of previously learned information and associations to construct new associations and verbal abstractions		

restatement	Restatement of new information in terms of acquired vocabulary and associations	Sentences/ Definitions - Short Paragraphs	Organized discourse and definitions; could also be used for diagram/graph explanations
paraphrasing			
visualizing	Restatement in visual images		
discourse elaboration	Creation of short verbal stories and/or pictures to comprehend concepts and integrate component parts of definitions	Extended Description and Definitions	Discourse containing new vocabulary (English or foreign) accompanied by translations
visual			
verbal			
analysis/ outlining	The process of identifying and portraying the existing elements and relations and/ or organizational structure; involves inferences about meaning from context cues, sentence structure, and grammar	Multi-Level Information	Discourse containing many component parts, levels of ideas, sequences of types of information
content			
organization			Hierarchically organized words/relations
summarizing	Reduction of important information by high level generalizations and abstractions	Paragraphs and Multi-Level Information	Conceptually related sentences
			Same as multi-level above.
transformation	Perception of underlying or implicit structure plus transformation of information into new structure	Paragraphs and Multi-Level Information	Same as above.
reordering	Perception of two or more sets of conceptual relations (e.g., name and attribute categories) plus reorganization	Scrambled Lists or Discourse (Narrative or text)	Disorganized or randomly organized words or sentences are cross-classifiable
cross-classification			
subjective organization	Creation of complex and possibly idiosyncratic associative chains of conceptually unrelated words		Extended lists of unrelated words or sentences

transformational representations mapping graphic representation matrix outlining	Perception of underlying structure of information plus transformation of prose into charts, tables, networks, graphs, and symbols	Extended Complex Discourse	Same as above.
REASONING STRATEGIES	Strategies which redefine or create overall meaning and organization when it is not explicit or implicit, or when it is extremely complex	Unclear or Unrelated Discourse	Discourse that is extremely complex, abstract, and unfamiliar, or differentiated discourse (two or more separate prose passages)
constructive inference	Constructing meaning through the use of previously learned information and associations, complex inductive and deductive logic, and analysis of text and test context	Difficult-to-Comprehend Discourse	Argumentative, complex, and inferential Unclear, ambiguous, or illogical Unfamiliar words and concepts not accompanies by definitions or adequate explanation
reconceptualization matrix outlining	The process of imposing a new organizational structure on complex discourse in which the imposed structure was not stated or implied by the author	Poorly Conceptualized Discourse	A single passage which is poorly organized or organized in different dimension from that imposed by the learner
synthesis prose models	The process of imposing a single organizational structure on two or more different sets of previously unrelated, unorganized materials	Diverse Passages or Stories	Two or more unrelated passages or stories usually containing extended description, unclear discourse, and/or multi-level discourse

FIGURE 1

TYPES OF UNDERLYING AND MANIFEST PROSE STRUCTURES

SUBORDINATE STRUCTURES	COORDINATE STRUCTURES	SEQUENTIAL STRUCTURES
A. Proposition and details	A. Compare-and-contrast	A. Series of events
Main idea = proposition/ opinion	Main idea #1 = similarities Similarity #1 Similarity #2	Main idea = definitio of event parameters
Fact/reason/detail 1 Fact/reason/detail 2	Main idea #2 = differences Difference #1 Difference #2	Event 1 Event 2 Event 3
B. Name/topic and details	B. Conflict-and-resolution/ problem-and-solution	B. Step-by-step process
Main idea = name/topic	Main idea #1 = problem/ conflict	Main idea = definitio of process parameters
Attribute/fact 1 Attribute/fact 2	Attribute/part 1 Attribute/part 2	Step 1 Step 2 Step 3
C. Vocabulary term/concept and details	Main idea #2 = solution/ resolution Attribute/part 1 Attribute/part 2	
Main idea = term/concept	C. Post hoc cause-and-effect	
Critical features Examples Non-examples	Main idea #1 = statement of effect Attribute/part 1 Attribute/part 2	
D. Subject and hodge-podge	Main idea #2 = analysis of cause Variable 1/reason 1 Variable 2/reason 2	
Main idea = subject/name/ topic	D. Goal-and-outcome	
Distracting rhetorical question Relevant fact/ attribute Trivial comment	Main idea #1 = statement of goal Attribute/part 1 Attribute/part 2	
	Main idea #2 = outcome(s) Attribute/part 1 Attribute/part 2	

TABLE 2

TEXT FUNCTIONS AND STRUCTURES

	NARRATIVE	EXPOSITORY	PERSUASIVE
SUBORDINATE			
Proposition plus elements/reasons	+	++	++
Name/topic plus attributes/details	++	+	+
Concept/term plus features/examples		+	+
COORDINATE			
Compare-and-contrast	+	++	++
Problem-and-solution	+	++	++
Conflict-and-resolution	++	+	+
Cause-and-effect	++	++	++
Goal-and-outcome	++	+	
SEQUENTIAL			
Series of events	++	++	
Step-by-step	+	+	

\+ indicates frequent occurence
++ indicates very common occurence

EXERCISE F STORIES AND PROBLEMS Story 1

SOMETHING I WILL NEVER FORGET
by David Harwell

I will never forget how I got a scar on my face. One day I was playing Batman. I tried to catch my brother. He went into the bathroom and I put some chairs in front of the door, but I forgot that the door opened the other way. He opened the door and jumped out and I jumped into the bathroom and hit the stool. I thought nothing happened, but when I looked in the mirror, I screamed. My head was all bloody. That's how I got my scar. Batman fails again.

Beginning	SETTING _____ (where and when) MAIN CHARACTER _____ (who) GOAL to catch his brother (what main character wants to do)
Middle	ATTEMPT tries to trap him in the bathroom (how main character tries to reach goal) RESULT brother escapes (what happens to main character)
End	FINAL RESULT He fails-cuts his head and gets a scar. (Does main character reach goal?) REACTION _____ (How does main character feel at end?)

FIGURE 2

EXAMPLE OF STRUCTURAL PROMPT EMBEDDED IN THE TEXT